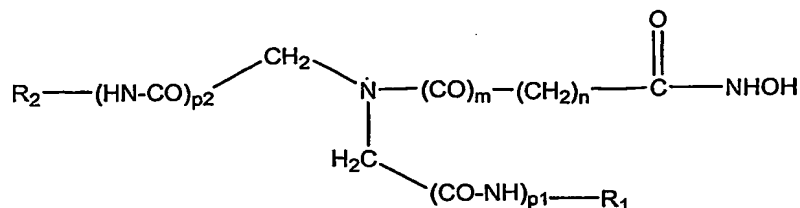


What is claimed is:

1. A compound represented by the following structural formula:



(I)

wherein

n is 2, 3, 4, 5, 6, 7 or 8;

m is 0 or 1;

p₁ and p₂ are independently of each other 0 or 1;

R₁ and R₂ are independently of each other an unsubstituted or substituted aryl, heteroaryl, cycloalkyl, heterocyclyl, alkylaryl, alkylheteroaryl, alkylcycloalkyl or alkylheterocyclyl; or when p₁ and p₂ are both 0, R₁ and R₂ together with the -CH₂-N-CH₂- group to which they are attached can also represent a nitrogen-containing heterocyclic ring; or when at least one of p₁ or p₂ is not 0, R₁ or R₂ or both can also represent hydrogen or alkyl;

and pharmaceutically acceptable salts, solvates, hydrates, prodrugs and polymorphs thereof.

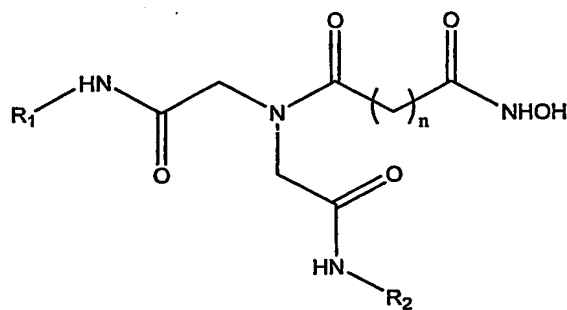
2. The compound of claim 1, wherein p₁ and p₂ are both 0.

3. The compound of to claim 1, wherein p₁ and p₂ are both 1.

4. The compound of claim 1, wherein m is 0.

5. The compound of claim 1, wherein m is 1.

6. A compound represented by the following structural formula:



(II)

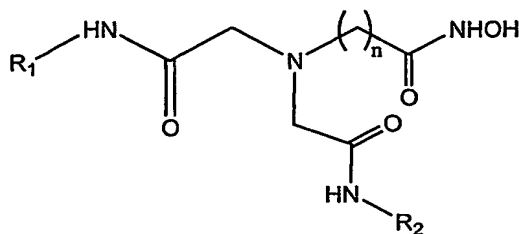
wherein

n is 2, 3, 4, 5, 6, 7 or 8;

R₁ and R₂ are independently of each other a hydrogen or an unsubstituted or substituted alkyl, aryl, heteroaryl, cycloalkyl, heterocyclyl, alkylaryl, alkylheteroaryl, alkylcycloalkyl or alkylheterocyclyl;

and pharmaceutically acceptable salts, solvates, hydrates, prodrugs and polymorphs thereof.

7. A compound represented by the following structural formula:



(III)

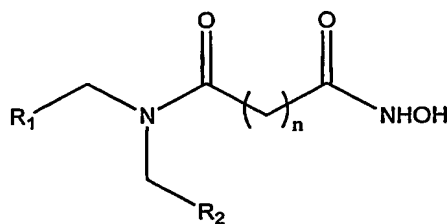
wherein

n is 2, 3, 4, 5, 6, 7 or 8;

R₁ and R₂ are independently of each other a hydrogen or an unsubstituted or substituted alkyl, aryl, heteroaryl, cycloalkyl, heterocyclyl, alkylaryl, alkylheteroaryl, alkylcycloalkyl or alkylheterocyclyl;

and pharmaceutically acceptable salts, solvates, hydrates, prodrugs and polymorphs thereof.

8. A compound represented by the following structural formula:



(IV)

wherein

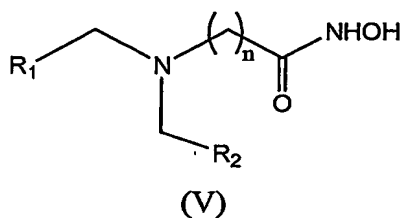
n is 2, 3, 4, 5, 6, 7 or 8;

R₁ and R₂ are independently of each other an unsubstituted or substituted aryl, heteroaryl, cycloalkyl, heterocyclyl, alkylaryl, alkylheteroaryl, alkylcycloalkyl

or alkylheterocyclyl; or R₁ and R₂ together with the -CH₂-N-CH₂- group to which they are attached can also represent a nitrogen-containing heterocyclic ring;

and pharmaceutically acceptable salts, solvates, hydrates, prodrugs and polymorphs thereof.

9. A compound represented by the following structural formula:



wherein

n is 2, 3, 4, 5, 6, 7 or 8;

R₁ and R₂ are independently of each other an unsubstituted or substituted aryl, heteroaryl, cycloalkyl, heterocyclyl, alkylaryl, alkylheteroaryl, alkylcycloalkyl or alkylheterocyclyl; or R₁ and R₂ together with the -CH₂-N-CH₂- group to which they are attached can also represent a nitrogen-containing heterocyclic ring;

and pharmaceutically acceptable salts, solvates, hydrates, prodrugs and polymorphs thereof.

10. The compound of any of claims 1 to 9, wherein n is 5.

11. The compound of any of claims 1 to 9, wherein n is 6.

12. The compound of any of claims 1 to 11, wherein at least one of R₁ and R₂ is an unsubstituted or substituted phenyl, benzyl, alkylphenyl, naphthyl, biphenyl, -CH(Ph)₂, -CH=CHPh, cyclohexyl, alkylcyclohexyl, quinoliny, alkylquinoliny, isoquinoliny, alkylisoquinoliny, tetrahydroquinoliny, alkyltetrahydroquinoliny, tetrahydroisoquinoliny, alkyltetrahydroisoquinoliny, indazolyl, alkylindazolyl, benzothiazolyl, alkylbenzothiazolyl, indolyl, alkylindolyl, piperazinyl, alkylpiperazinyl, morpholiny, alkylmorpholiny, piperidinyl, alkylpiperidinyl, pyridyl or alkylpyridyl.

13. The compound of claim 6 or claim 7, wherein at least one of R₁ and R₂ is hydrogen, methyl, ethyl, propyl, isopropyl, butyl, isobutyl sec-butyl or tert-butyl.

14. The compound of claim 8 or 9, wherein R_1 and R_2 together with the $-\text{CH}_2\text{-N-CH}_2-$ group to which they are attached represent a nitrogen-containing heterocyclic ring.
- 5 15. The compound of any of claims 1-14, wherein said compound is a histone deacetylase (HDAC) inhibitor.
16. The compound of any of claims 1-14, wherein said compound is a Class I histone deacetylase (Class I HDAC) inhibitor.
17. The compound of claim 16, wherein said Class I histone deacetylase is histone deacetylase 1 (HDAC-1), histone deacetylase 2 (HDAC-2), histone deacetylase 3 (HDAC-3) or histone deacetylase 8 (HDAC-8).
10
18. The compound of claim 16, wherein said Class I histone deacetylase is histone deacetylase 1 (HDAC-1).
19. The compound of any of claims 1-14, wherein said compound is a Class II histone deacetylase (Class II HDAC) inhibitor.
- 15 20. The compound of claim 19, wherein said Class II histone deacetylase is histone deacetylase 4 (HDAC-4), histone deacetylase 5 (HDAC-5), histone deacetylase 6 (HDAC-6), histone deacetylase 7 (HDAC-7) or histone deacetylase 9 (HDAC-9).
21. A composition comprising a pharmaceutically effective amount of the compound of any of claims 1-14.
- 20 22. A pharmaceutical composition comprising a pharmaceutically effective amount of the compound of any of claims 1-14, and a pharmaceutically acceptable carrier.
23. A method of inhibiting the activity of histone deacetylase comprising contacting the histone deacetylase with an effective amount of the compound of any one of claims 1-14 so as to inhibit the activity of histone deacetylase.
- 25 24. A method of inhibiting the activity of histone deacetylase 1 (HDAC-1), comprising contacting HDAC-1 with an effective amount of the compound of any one of claims 1-14 so as to inhibit the activity of HDAC-1.
25. A method of treating cancer in a subject in need of treatment comprising administering to said subject a therapeutically effective amount the compound of any one of claims 1-14, wherein said amount is effective to treat cancer in said subject.
30
26. The method of claim 25, wherein the cancer is selected from the group consisting of acute leukemia such as acute lymphocytic leukemia (ALL) and acute myeloid leukemia (AML); chronic leukemia such as chronic lymphocytic leukemia (CLL) and

chronic myelogenous leukemia (CML), Hairy Cell Leukemia, cutaneous T-cell lymphoma (CTCL), noncutaneous peripheral T-cell lymphoma, lymphoma associated with human T-cell lymphotropic virus (HTLV) such as adult T-cell leukemia/lymphoma (ATLL), Hodgkin's disease, non-Hodgkin's lymphoma, large-cell lymphoma, diffuse large B-cell lymphoma (DLBCL); Burkitt's lymphoma; primary central nervous system (CNS) lymphoma; multiple myeloma; childhood solid tumors such as brain tumor, neuroblastoma, retinoblastoma, Wilm's tumor, bone tumor, soft-tissue sarcoma, head and neck cancers (e.g., oral, laryngeal and esophageal), genitourinary cancers (e.g., prostate, bladder, renal, uterine, ovarian, testicular, rectal and colon), lung cancer, breast cancer, pancreatic cancer, melanoma and other skin cancers, stomach cancer, brain tumors, liver cancer and thyroid cancer.

27. A method of treating a thioredoxin (TRX)-mediated disease in a subject in need thereof, comprising the step of administering to said subject a therapeutically effective amount of the compound of any one of claims 1-14, wherein the amount of said compound is effective to treat the TRX-mediated disease in said subject.

28. The method of claim 27, wherein said TRX-mediated disease is an inflammatory disease, an allergic disease, an autoimmune disease, a disease associated with oxidative stress or a disease characterized by cellular hyperproliferation.

29. A method of treating a disease of the central nervous system (CNS) in a subject in need thereof comprising administering to said subject a therapeutically effective amount of the compound of any one of claims 1-14, wherein said amount is effective to treat the CNS disease in said subject.

30. The method of claim 29, wherein the disease is a polyglutamine expansion disease.

31. A method of selectively inducing terminal differentiation of neoplastic cells in a subject and thereby inhibiting proliferation of said cells in said subject, comprising the step of administering to said subject a compound of any one of claims 1-14, in an amount effective to induce terminal differentiation of neoplastic cells in said subject.

32. A method of selectively inducing cell growth arrest of neoplastic cells in a subject and thereby inhibiting proliferation of said cells in said subject, comprising the step of administering to said subject a compound of any one of claims 1-14, in an amount effective to induce cell growth arrest of neoplastic cells in said subject.

33. A method of selectively inducing apoptosis of neoplastic cells in a subject and thereby inhibiting proliferation of said cells in said subject, comprising the step of

administering to said subject a compound of any one of claims 1-14, in an amount effective to induce apoptosis of neoplastic cells in said subject.

34. A method of treating a patient having a tumor characterized by proliferation of neoplastic cells, comprising the step of administering to the patient a compound of any one of claims 1-14, in an amount effective to selectively induce terminal differentiation, induce cell growth arrest and/or induce apoptosis of such neoplastic cells and thereby inhibit their proliferation.

35. The method of any of claims 25-34, wherein said administering comprises administering a pharmaceutical composition comprising said compound, and a pharmaceutically acceptable carrier.

36. The method of claim 35, wherein the pharmaceutical composition is administered orally.

37. The method of claim 36, wherein said composition is administered to the subject at a total daily dosage of between about 25-4000 mg/m².

38. The method of claim 36, wherein said composition is administered once-daily, twice-daily or three times-daily.

39. The method of claim 36, wherein said composition is administered once daily at a dose of about 200-600 mg.

40. The method of claim 36, wherein said composition is administered twice daily at a dose of about 200-400 mg.

41. The method of claim 36, wherein said composition is administered twice daily at a dose of about 200-400 mg intermittently.

42. The method of claim 36, wherein said composition is administered three times daily at a dose of about 100-250 mg.

43. An *in vitro* method of selectively inducing terminal differentiation of neoplastic cells and thereby inhibiting proliferation of such cells which comprises contacting the cells under suitable conditions with an effective amount of the compound of any one of claims 1-14, wherein the amount of the compound is effective to selectively induce terminal differentiation of such neoplastic cells.

44. An *in vitro* method of selectively inducing cell growth arrest of neoplastic cells and thereby inhibiting proliferation of such cells which comprises contacting the cells under suitable conditions with an effective amount of the compound of any one of

claims 1-14, wherein the amount of the compound is effective to selectively induce cell growth arrest of such neoplastic cells.

45. An *in vitro* method of selectively inducing apoptosis of neoplastic cells and thereby inhibiting proliferation of such cells which comprises contacting the cells under
5 suitable conditions with an effective amount of the compound of any one of claims 1-14, wherein the amount of the compound is effective to selectively induce apoptosis of such neoplastic cells.

46. An *in vitro* method of inducing terminal differentiation of tumor cells in a tumor comprising contacting said tumor cells with an effective amount of the compound of
10 any one of claims 1-14, wherein the amount of the compound is effective to selectively induce terminal differentiation of such tumor cells.